

## CLAIMS

What is claimed:

- 1           1.     A piston cylinder unit comprising:
  - 2           a closed cylinder having an end wall;
  - 3           a piston rod guided through said end wall;
  - 4           a piston fixed to said piston rod for axial displacement in said cylinder,
  - 5       said piston dividing said cylinder into a working space surrounding the piston rod and a
  - 6       working space away from the piston rod;
  - 7           an annular seal between said piston and said cylinder;
  - 8           a volume equalizing space in said piston;
  - 9           a first valve which can be opened under pressure to admit fluid from said
  - 10       working space away from said piston rod to said volume equalizing space,
  - 11          a second valve which can be opened under pressure to admit fluid from
  - 12       said working space surrounding said piston rod to said volume equalizing space,;
  - 13          a first non-return valve which can admit fluid from said volume equalizing
  - 14       space to said working space away from said piston rod; and
  - 15          a second non-return valve which can admit fluid from said volume
  - 16       equalizing space to said working space surrounding said piston rod.
- 1           2.     A piston-cylinder unit as in claim 1 wherein said volume equalizing
- 2       chamber has a fluid capacity which increases under pressure loading and decreases
- 3       under pressure relief.

1                   3.     A piston-cylinder unit as in claim 2 further comprising a volume-  
2 equalizing element in said volume-equalizing chamber, said element having a volume  
3 which decreases under pressure loading and increases under pressure relief.

1                   4.     A piston-cylinder unit as in claim 3 wherein said volume equalizing  
2 element has an elastomeric wall enclosing a space filled with a gas.

1                   5.     A piston-cylinder unit as in claim 1 wherein at least one of said  
2 valves which can be opened under pressure is a non-return valve which is loaded in a  
3 closing direction by a closing force.

1                   6.     A piston-cylinder unit as in claim 5 wherein said at least one of said  
2 valves which can be opened under pressure comprises a closing element which is  
3 loaded in a closing direction by one of a helical compression spring and a cup-type  
4 compression spring.

1                   7.     A piston-cylinder unit as in claim 5 wherein at least one of said  
2 valves which can be opened under pressure is a seat valve.

1                   8.     A piston-cylinder unit as in claim 5 wherein at least one of said  
2 valves which can be opened under pressure is a slide valve.

1                   9.     A piston-cylinder unit as in claim 5 wherein said at least one of said  
2 valves which can be opened under pressure comprises a valve chamber in said piston  
3 and a valve piston bearing a closing element in said chamber, said valve piston being

4 loaded in said closing direction by said closing force and acted upon in an opening  
5 direction by pressure in a respective at least one of said working spaces.

1 10. A piston-cylinder unit as in claim 9 wherein one of said closing  
2 element and said valve piston of said at least one of said valves is loaded in the closing  
3 direction by a spring.

1 11. A piston-cylinder unit as in claim 1 wherein said spring comprises  
2 one or more spring arms supported on the piston and applying a force which is  
3 degressive so that said closing element is subject to less force in a closing direction as  
4 said closing element moves in an opening direction.

1 12. A piston-cylinder unit as in claim 9 wherein one of said closing  
2 element and said valve piston of said at least one of said valves is loaded in the closing  
3 direction by magnetic forces.

1 13. A piston-cylinder unit as in claim 12 wherein said at least one of  
2 said valves which can be opened under pressure comprises a permanent magnet on  
3 one of said valve piston and said piston and a ferromagnetic component on the other of  
4 said valve piston and said piston.

1 14. A piston-cylinder unit as in claim 9 wherein said at least one of said  
2 valves which can be opened under pressure is retained in an open position by a  
3 retaining force which is smaller than said closing force, said retaining force added to  
4 said pressure being larger than said closing force.

1           15.    A piston-cylinder unit as in claim 14 further comprising a latching  
2 element on one of said valve piston and said piston, and a latch on the other of said  
3 valve piston and said piston, said latching element and said latch providing said  
4 retaining force.

1           16.    A piston-cylinder unit as in claim 14 further comprising a snap  
2 spring arranged on the valve piston, said snap spring having a snap arm which is  
3 contact with said piston without any substantial axial force in the closed position, and  
4 cooperates with said piston to provide said retaining force in the open position.

1           17.    A piston-cylinder unit as in claim 9 further comprising at least one  
2 permanent magnet arranged on said valve piston and at least one permanent magnet  
3 arranged on said piston, said permanent magnets being arranged to provide said  
4 closing force when said valve piston is in a closed position and said retaining force  
5 when said valve piston is in an open position.

1           18.    A piston-cylinder unit as in claim 1 wherein said annular seal is  
2 designed to form said first and second non-return valves.

1           19.    A piston cylinder unit as in claim 18 wherein said annular seal  
2 comprises two axially spaced annular sealing lips which bear against said cylinder and  
3 form a space therebetween, said piston comprising a connecting line which connects  
4 said volume-equalizing chamber to said space between said annular sealing lips.

1           20. A piston-cylinder unit as in claim 18 wherein said annular seal  
2 comprises two axially spaced valve flaps separated by a sealing ring which bears  
3 elastically against said cylinder, said piston comprising a pair of connecting lines which  
4 open radially on said piston and lead to the volume-equalizing chamber, said valve flaps  
5 closing respective said connecting lines.